What is claimed is:

1. A vessel comprising:

a hull having a forebody extending about 0.6 times a waterline length of the vessel from a stem and an afterbody extending thereafter to a stern, wherein the hull is characterized by an immersed sectional area distribution providing a volume with concave surfaces in the forebody, a stem that is raked forward so that waterlines from the stem to about 0.4 of the distance from the stem to the stern to form concave contours, and a bow keel that extends about one tenth of the waterline length of the vessel and has a slope no greater than about .067 radians.

2. The vessel of claim 1 wherein the immersed sectional area distribution further provides a volume with convex surfaces in the afterbody.

3. The vessel of claim 1 wherein the hull comprises an original hull with appendages that modify a shape of the original hull.

4. The vessel of claim 3 wherein the appendages are sponsons.

5. The vessel of claim 2 wherein the hull further includes a transom and an aft keel that slopes up and aft at about 0.69 of the distance from the stem to the stern and extends to the transom.

6. The vessel of claim 5 wherein the stern has a rise of less than about 0.027 radians.

7. The vessel of claim 1 wherein the hull is a full displacement hull for use in a mode where wave-making characteristics are present.

8. A vessel comprising:

a hull having forebody extending from a stem and an afterbody extending

thereafter to a stern, wherein the hull is characterized by an immersed sectional area distribution providing a volume with concave surfaces in the forebody, and wherein the average of the beam at the immersed chine and the beam at the load waterline is substantially given as follows:

B2 = (.39)(B) if [2HB - (1.40)Ax]/B is less than H;

B3 = (.66)(B);

B4 = (.84)(B);

B5 = (.94)(B); and

B6 = (.98)(B);

where Bn is the average at tenths of the waterline length along the waterline, B is a maximum beam at the load waterline, H is a design draft of the vessel, and Ax is a maximum immersed cross sectional area.

9. The vessel of claim 8 wherein the immersed sectional area distribution further provides a volume with convex surfaces in the afterbody.

10. The vessel of claim 8 wherein the hull comprises an original hull with appendages that modify a shape of the original hull.

11. The vessel of claim 10 wherein the appendages are sponsons.

12. The vessel of claim 8 wherein the hull is a full displacement hull for use in a mode where wave-making characteristics are present.

13. A vessel comprising:

a hull having a forebody, wherein the hull is characterized by an immersed sectional area distribution providing a volume with concave surfaces in the forebody, wherein the first station has an immersed bow section that is a simple triangle, and a beam that is substantially given as follows:

$$Bd1 = [(.067)(Ax)]/(H - K1),$$

where H is the design draft, Bd1 is the beam of the first station at the design draft, Ax is a maximum immersed cross sectional area, and K1 is the height of a keel above a base line at the first station.

14. The vessel of claim 13 wherein the immersed sectional area distribution further provides a volume with convex surfaces in the afterbody.

15. The vessel of claim 13 wherein the hull is a full displacement hull for use in a mode where wave-making characteristics are present.

16. A vessel comprising:

a hull having a forebody and an afterbody;

wherein the hull is characterized by an immersed sectional area distribution providing a volume with concave surfaces in the forebody, wherein:

$$[2HB-(1.40)Ax]/B > H,$$

where H is a design draft of the hull, B is a maximum beam of the hull, and Ax is a maximum immersed cross sectional area of the hull; and

wherein the hull has a first station with an immersed bow section that is a simple triangle, and a second station with a beam that is substantially given as follows:

$$Bd2 = [(0.54)(Ax)]/H$$

where Bd2 is the beam at the second station.

17. The vessel of claim 16 wherein the immersed sectional area distribution further provides a volume with convex surfaces in the afterbody.

18. The vessel of claim 16 wherein the hull is a full displacement hull for use in a mode where wave-making characteristics are present.

19. A vessel comprising:

a hull having a forebody and an afterbody, wherein the hull is characterized by an immersed sectional area distribution providing a volume with concave surfaces in the forebody; and

wherein the immersed sectional area, An, at the first seven tenths of the distance from stem to stern, where n=l through 7, and Ax is the maximum immersed cross sectional area, is substantially given as follows:

A1 = (.033)Ax ;

A2 = (.27)Ax ;

A3 = (.57)Ax ;

A4 = (.79)Ax ;

A5 = (.92)Ax ;

A6 = (.98)Ax ; and

A7 = Ax.

20. The vessel of claim 19 wherein the immersed sectional area distribution further provides a volume with convex surfaces in the afterbody.

21. The vessel of claim 19 wherein the hull is a full displacement hull for use in a mode where wave-making characteristics are present.

22. The vessel of claim 19 wherein the hull comprises an original hull with appendages that modify a shape of the original hull.

23. The vessel of claim 22 wherein the appendages are sponsons.

24. A vessel comprising:

a hull having a forebody and an afterbody;

wherein the hull is characterized by an immersed sectional area distribution

providing a volume with concave surfaces in the forebody and convex surfaces in the afterbody; and

further comprising a rise of the bow keel less than about 0.07 radians, extending from the stem to about 0.1L aft of the stem to enable concave waterline profiles in forward sections of the hull.

25. The vessel of claim 24 wherein the hull is a full displacement hull for use in a mode where wave-making characteristics are present.

26. A vessel comprising:

a hull having a block coefficient less than about 0.6, a load waterline and a chine that is above the load waterline at a first waterline station, wherein the hull is characterized by second order of differences between waterline station offsets that are substantially represented by the following equations:

$Delta2_1 = .33(B)$

$Delta2_2 = -0.054(B)$

$Delta2_3 = -0.11(B)$

$Delta2_4 = -0.080(B)$

$Delta2_5 = -0.042(B)$

$Delta2_6 = -0.031(B)$

$Delta2_7 = -0.056(B)$

where $Delta2_n$ is the second order difference at the first seven waterline station offsets which are located at tenths of the distance from stem to stern, where n=l through 7, and B is a maximum waterline beam.

27. The vessel of claim 26 wherein the hull is a full displacement hull for use in a mode where wave-making characteristics are present.

28. A vessel comprising:

a hull having a block coefficient greater than about 0.6, a load waterline and a chine that is below the load waterline at a first waterline station, wherein the hull is characterized by second order of differences between waterline station offsets that are substantially represented by the following equations:

$Delta2_1 = .26(B)$

$Delta2_2 = -0.0042(B)$

$Delta2_3 = -0.077(B)$

$Delta2_4 = -0.068\ (B)$

$Delta2_5 = -0.062\ (B)$

$Delta2_6 = -0.023(B)$

$Delta2_7 = -0.064\ (B)$

where $Delta2_n$ is the second order difference at the first seven waterline station offsets which are located at tenths of the distance from stem to stern, where n=l through 7, and B is a maximum waterline beam.

29. The vessel of claim 28 wherein the hull is a full displacement hull for use in a mode where wave-making characteristics are present.

30. A vessel comprising:

a hull having a forebody having a first and second section, a chine, and an after body;

wherein the hull is characterized by an immersed sectional area distribution providing a volume with concave surfaces in the forebody, wherein:

$(1.52)(2)[H(B2)-(.27)Ax]/B2 < H$

where H is a design draft of the hull, B2 is an average of a beam at an immersed location of the chine and a beam at an immersed waterline at the second section, and Ax is a maximum immersed cross sectional area of the hull;

wherein the chine has a height at the first station that is below the design draft of

the hull; and

wherein a beam of the first station at the design draft is substantially given as follows:

$$Bd1 = [(.13)(Ax)]/(H-K1),$$

where H is a design draft of the vessel, Bd1 is a beam of a first station at the design draft, Ax is a maximum immersed cross sectional area, and K1 is a height of a keel above a base line at the first station.

31. The vessel of claim 30 wherein the hull is a full displacement hull for use in a mode where wave-making characteristics are present.

32. A vessel comprising:

a hull having a forebody extending about 0.6 times a waterline length of the vessel from a stem, and an afterbody extending thereafter to a stern, wherein the hull is characterized by an immersed sectional area distribution providing a volume with concave surfaces in the forebody, and a stem that is raked forward so that waterlines from the stem to about 0.4 of the distance from the stem to stern form concave contours, and wherein the rate of change between immersed sectional areas of the bow per 1/10 division of waterline length is substantially given as the following absolute values:

$$n = 1 : \{ | A_n - A_{n-1} |/(Ax)(0.1)\} = .33$$

$$n = 2: \{ | A_n - A_{n-1} |/(Ax)(0.1)\} = 2.4$$

$$n = 3: \{ | A_n - A_{n-1} |/(Ax)(0.1)\} = 3.03$$

$$n = 4: \{ | A_n - A_{n-1} |/(Ax)(0.1)\} = 2.2$$

where n is a station corresponding to a 1/10 division of waterline length, A_n, is the immersed sectional area at station n, and Ax is the maximum immersed cross sectional area.

33. The vessel of claim 32 wherein the hull is a full displacement hull for use in a mode where wave-making characteristics are present.